

**Bass Beach, North Hampton**

**BEACH WATER QUALITY REPORT**

**SUMMER 2004**



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Prepared by: Alicia Carlson and Sara Sumner



## BACKGROUND

The New Hampshire Department of Environmental Services (NHDES) has operated its Public Beach Inspection Program, or Beach Program, for over twenty years. Coastal beach monitoring began in 1989 and has continued through the present. NHDES recognizes the threat to public health at public beaches and continues to monitor public beaches throughout the state for the presence of pathogenic organisms. Coastal beaches are monitored for the presence of the fecal bacteria *Enterococci*. These fecal bacteria are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. They are also known as indicator organisms, meaning their presence in water may indicate the presence of other potentially pathogenic organisms.

In October of 2000, the United States Environmental Protection Agency (EPA) signed into law the Beaches Environmental Assessment and Coastal Health (BEACH) Act. The BEACH Act is an amendment to the Clean Water Act that authorizes the EPA to award grants to eligible states. The purpose of the BEACH Act is to reduce the risk of disease to users of the nation's recreational waters. BEACH Act grants provide support for development and implementation of monitoring and notification programs that help protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

NHDES received grant funding in 2002 to develop and implement a beach monitoring and notification program consistent with EPA's performance criteria requirements published in the *National Beach Guidance and Required Performance Criteria for Grants* document ([www.epa.gov/waterscience/beaches/grants](http://www.epa.gov/waterscience/beaches/grants)). NHDES has successfully met all requirements and continues to expand the monitoring and notification program. In 2002, only 9 coastal beaches were monitored, in 2003 fifteen coastal beaches and in 2004 sixteen coastal beach were monitored on a routine basis.

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## Beach Description

Bass Beach is a pebble beach. Its total length is 1,220 feet. The beach is frequently used by residents for relaxing and surfing. There is one access point to the beach area from Route 1A. Lifeguards are not present during the summer and sanitary facilities are unavailable. Waterfowl and domestic animals (dogs) are not frequently observed on the beach.

Below is a brief description of the sampling stations at Bass Beach. All stations can be accessed via the entrance to the beach off Route 1A. Parking is available on Causeway Rd.

- The left sample station is located about 15 feet to the right of the entrance.
- The center sample station is located about 20 feet from the left sample station.
- The right sample station is located about 20 feet from the center sample station.
- The Chapel Brook sample is collected upstream of Route 1A, prior to the water entering the culvert that goes under the road toward the beach.

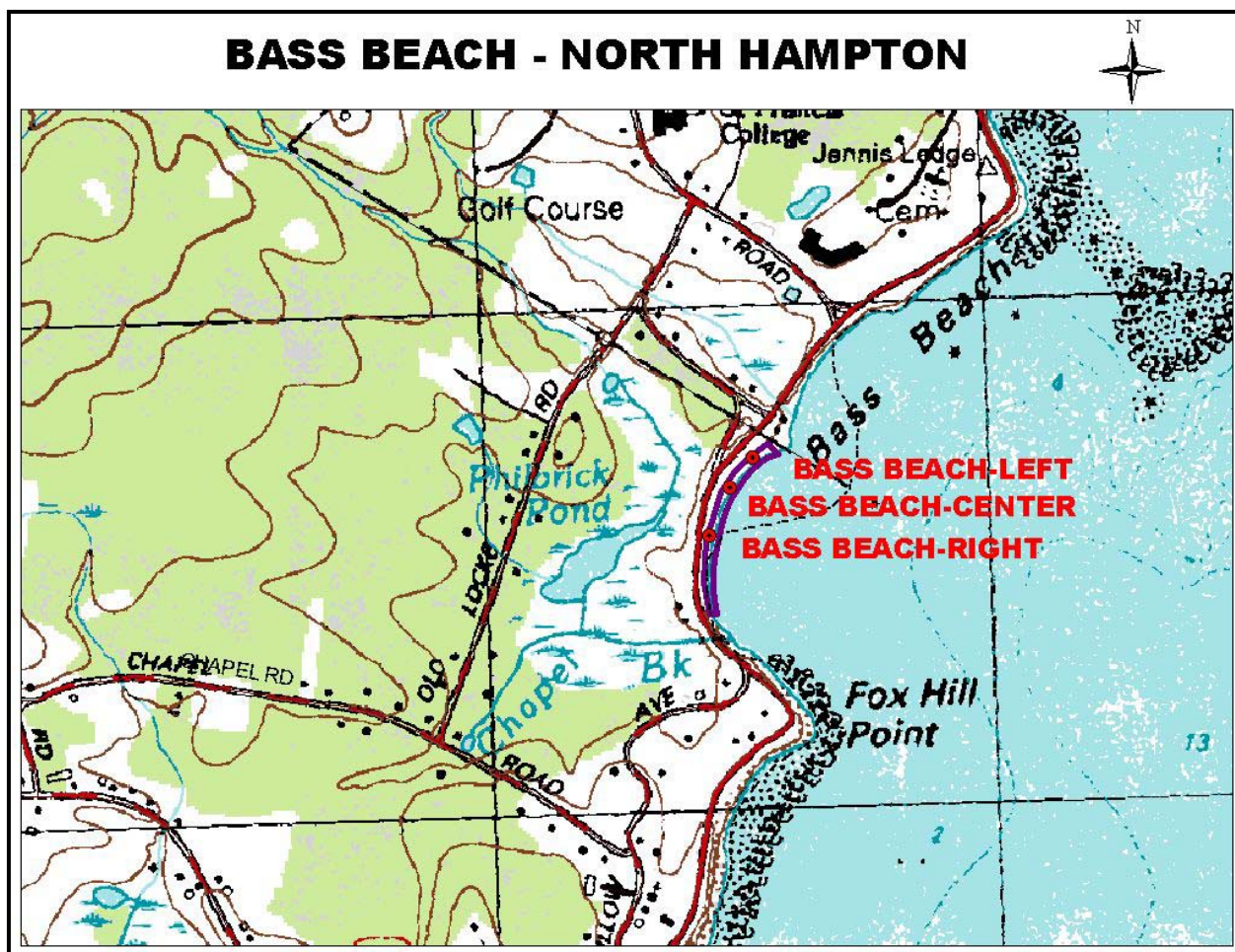


Figure 1. Map of Bass Beach

## **Tier Status and Sampling Frequency**

The Beach Program developed a risk-based beach evaluation process and tiered monitoring approach and implemented this approach during the 2003 beach season. Beach evaluations are conducted annually to determine potential health threats to the public. Evaluations are based on several criteria in three main categories: beach history, microbial pathogen sources, and beach use. Based on these criteria, beaches are assigned either a Tier I or Tier II status. Tier I are high priority beaches that have an increased potential to affect public health while Tier II are low priority beaches that have less potential to affect public health. Beach sample frequency is based on the Tier statuses; Tier I beaches are sampled weekly and Tier II beaches are sampled every other week.

Bass Beach was categorized as a Tier II beach based on the Beach Program's Risk-Based Evaluation ranking system. This ranking indicates that this beach is infrequently used for swimming, although there are pollution sources present that may negatively affect public health. The Bass Beach Tier II ranking has remained in place since the ranking system was implemented.

## **Water Quality**

Beaches are monitored to ensure compliance with State Water Quality Standards. Marine waters are analyzed for the presence of the fecal bacteria *Enterococci*. *Enterococci* are known as indicator organisms, meaning their presence may indicate the presence of pathogenic bacteria. The state standard for *Enterococci* at public beaches is 104 counts/100 mL in one sample, or a geometric mean of 35 counts/100 mL in three samples collected over sixty days. Standard exceedances require the issuance and posting of a beach advisory. Beach advisories remain in effect until subsequent beach sampling indicates safe water quality conditions.

The number of samples collected at each beach is determined by the beach length. Beaches less than 100 feet in length are sampled at left and right locations 1/3 of the distance from either end of the beach. Beaches greater than 100 feet in length are bracketed into thirds and sampled at left, center and right locations. Routine sample collection may be enhanced by sampling known or suspected pollution sources to the beach area. Also, storm event sampling may be conducted at beaches where wet-weather events are expected to affect beach water quality.

The 2004 sampling season began June 1st. June was cooler and drier than normal, July was cooler and wetter than normal, while August was warmer and wetter than normal. The sampling season encompassed 108 days, of which precipitation was recorded on 42 days (based on Seabrook WWTF recorded precipitation). Twenty beach days (normal beach hours are considered 9:00 a.m. to 5:00 p.m.) were directly affected by precipitation.

Bass Beach was sampled once every two weeks from June 1st through Labor Day. Three samples were collected at left, center and right stations (Figure 1). There were a total of eight routine inspections performed and 24 samples collected in 2004. One advisory inspection was

performed after bacteria levels exceeded state standards. Chapel Brook was monitored on a routine basis (Table 2).

Table 1 includes the Enterococci data from each sampling event for this summer for Bass Beach. Overall, the Enterococci levels were moderately low. A beach bacteria advisory was issued on August 25, 2004 after samples collected on August 23, 2004 exceeded the state standard. Subsequent samples indicated Enterococci levels had returned to normal allowing the advisory to be removed. Rainfall totaled 3.62 inches on the three days prior to sample collection (data obtained from Seabrook WWTF). Inspection data noted that the water was a rusty color, turbid, and there was a large amount of seaweed (left side only). Inspection data also noted that Chapel Brook, which discharges to the southern end of the beach, was a rusty color with no visible bottom. The large amount of rainfall may have transported bacteria from Chapel Brook to the beach area. This, along with the lack of open-ocean flushing, may have allowed the bacteria to persist at the beach area.

Water quality at Bass Beach may be negatively affected by two brooks that discharge on either end of the beach. Chapel Brook discharges to the southern end of the beach and Bass Beach Brook discharges to the northern end of the beach. Both brooks have been subject to microbial source tracking studies. Microbial source tracking identifies the sources of fecal contamination as human, wildlife, domestic animals, and waterfowl. Human contamination and waterfowl are prevalent bacteria sources in Chapel Brook. Various wildlife as well as human bacteria sources were identified at Bass Beach Brook.

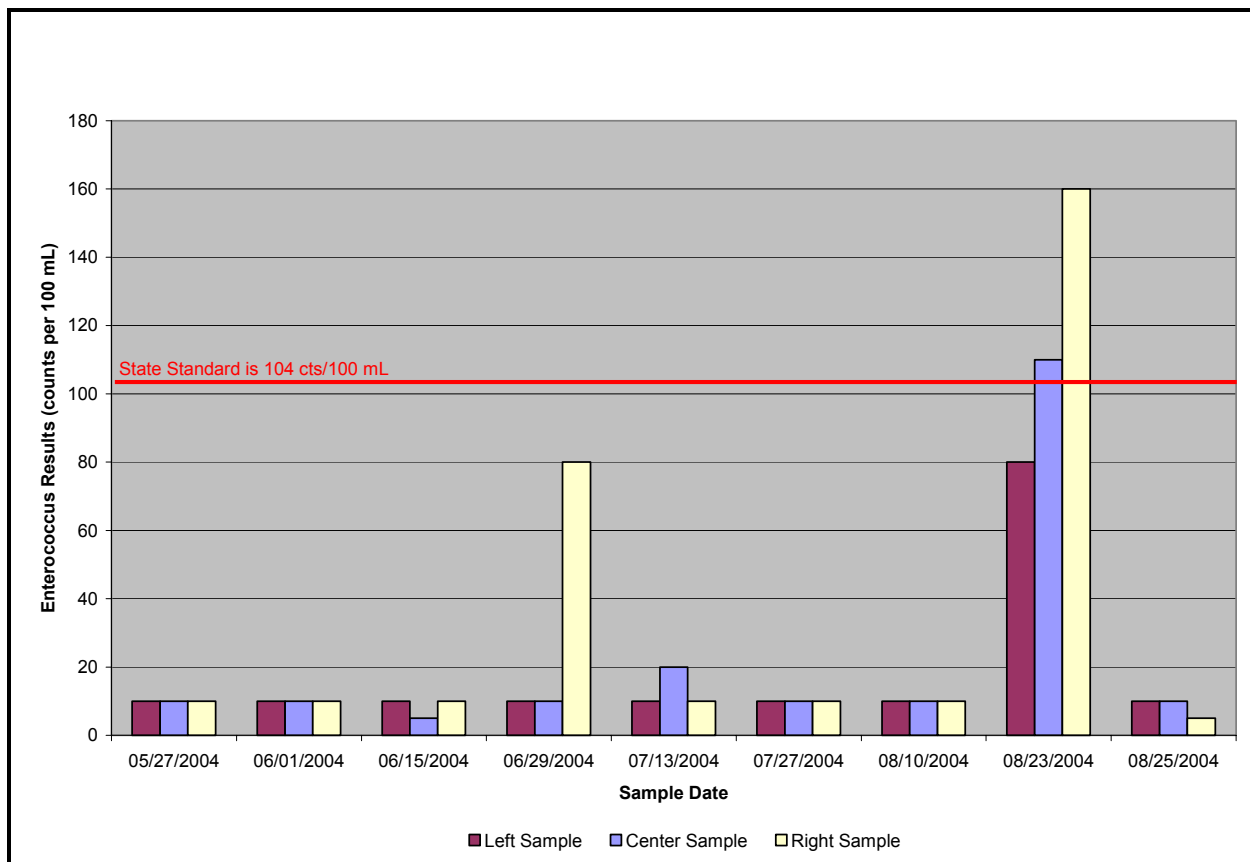
**Table 1. Bass Beach Enterococci Data 2004**

<b>Sample Date</b>	<b>Station Name</b>	<b>Results (counts per 100 mL)</b>
05/27/2004	Bass Beach – Left	<10
	Bass Beach – Center	10
	Bass Beach – Right	<10
06/01/2004	Bass Beach – Left	<10
	Bass Beach – Center	<10
	Bass Beach – Right	<10
06/15/2004	Bass Beach – Left	<10
	Bass Beach – Center	<5
	Bass Beach – Right	10
06/29/2004	Bass Beach – Left	10
	Bass Beach – Center	<10
	Bass Beach – Right	80
07/13/2004	Bass Beach – Left	<10
	Bass Beach – Center	20
	Bass Beach – Right	<10
07/27/2004	Bass Beach – Left	<10
	Bass Beach – Center	<10
	Bass Beach – Right	<10
08/10/2004	Bass Beach – Left	<10
	Bass Beach – Center	<10
	Bass Beach – Right	10
08/23/2004	Bass Beach – Left	80
	Bass Beach – Center	110
	Bass Beach – Right	160
08/25/2004	Bass Beach – Left	10
	Bass Beach – Center	<10
	Bass Beach – Right	<5

**Table 2. Chapel Brook Enterococci Data 2004**

<b>Sample Date</b>	<b>Results (counts per 100 mL)</b>
04/15/2004	<10
05/27/2004	10
06/15/2004	10
07/27/2004	20
08/10/2004	30
08/23/2004	450
08/25/2004	190

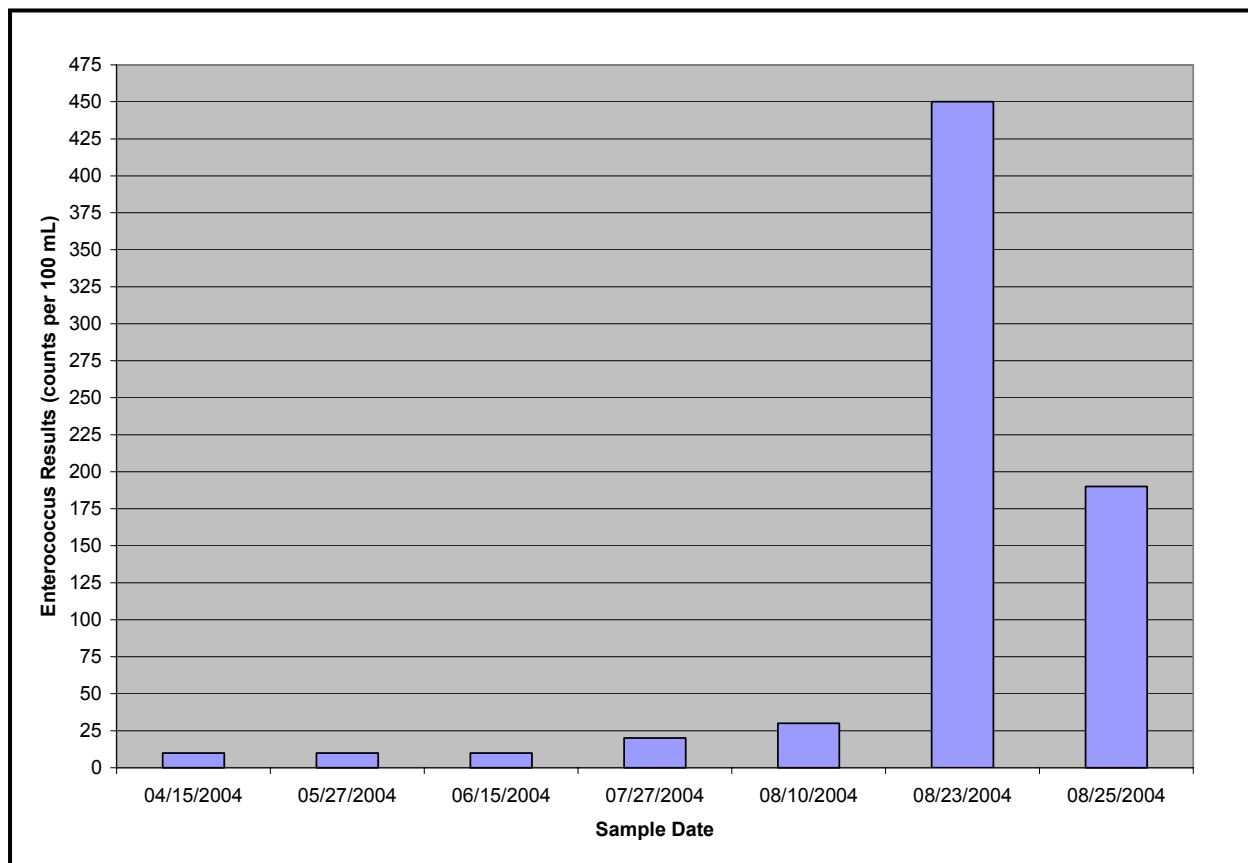
Figure 2 depicts Enterococci data in relation to the state standard for coastal beaches.



**Figure 2. Bass Beach Enterococci Data 2004**



Figure 3 depicts Enterococci data from Chapel Brook. This was the first season Chapel Brook was monitored to assess its impact on water quality at Bass Beach. Enterococci levels were low throughout the summer except after the heavy rainfall in August.



**Figure 3. Chapel Brook Enterococci Data 2004**

The Beach Program staff analyzed whether a relationship exists between elevated Enterococci levels and precipitation at Bass Beach. Analyses of the data indicate no direct correlation. DES will continue to monitor precipitation data and Enterococci levels. Precipitation often causes elevated bacteria levels due to runoff in the watershed.

### **Areas of Concern**

Chapel Brook and Bass Beach Brook are two areas of concern at Bass Beach. Both brooks have been identified as pollution sources contributing to elevated bacteria levels. As mentioned previously, both brooks were subject to microbial source tracking studies to identify the sources of bacterial pollution. Remediation efforts have begun at Bass Beach Brook to identify the human bacterial contributors. The cause is most likely a failing septic system. The town of Rye was notified and remediation actions recommended. More extensive sampling to identify human

sources on Chapel Brook will occur in 2005. Specifically, Chapel Brook will be bracketed at 5 sites to determine if the resident septic systems bordering the stream are failing.

The New Hampshire Department of Environmental Services Coastal Program is planning to restore the Philbrick Pond and Bass Beach salt marshes. The plan calls for removing the tidal restriction under Route 1A and creating an adequate system of tidal creeks to restore salt marsh flow. The tidal restriction is located where Chapel Brook discharges to coastal waters and Bass Beach. Removing the tidal restriction will increase flow both to and from the salt marsh. This increased flow could heighten the transport of bacteria to the beach area. The Beach Program expects to increase its monitoring efforts along both Chapel Brook and Bass Beach as a result of this project.

### **Thoughts for the Future**

- The Town of North Hampton, local businesses, or school group should consider joining NHDES' Adopt-a-Beach Program. The program would consist of beach clean-ups and water quality monitoring. DES would conduct training sessions and participate in education and outreach activities for the community. If you are interested, please contact Sara Sumner at 603-271-8803 or [ssumner@des.state.nh.us](mailto:ssumner@des.state.nh.us).